

## BOOK REVIEWS

**GLACIAL ENVIRONMENTS** by M. Hambrey, UCL Press, London, 1994. No. of pages: viii + 296. Price: £14.94 (pb). ISBN 1-85728-004-0.

*Glacial Environments* is a textbook aimed at students interested in glacial sediments. The rationale for the book is that the study of the Quaternary and glacial processes has been largely neglected in British geology departments. Rather, Hambrey argues that it has been left to geomorphologists in Geography departments, and perhaps as a result there has been a tendency to avoid rigorous application of sedimentological principles. The book aims to restore the balance by focusing on sediments and integrating the approaches of geomorphology and geology. More specifically, Hambrey wishes (a) to examine glacial processes; (b) to emphasize the range and character of glacial landforms; (c) to link Quaternary experience with the rock record of ancient glaciations; and (d) to stress the importance of the glaciomarine environment, which has been neglected in most textbooks.

How successful is the book in meeting these aims? It certainly succeeds in stressing the importance of glacial sediments. The introductory chapter is a useful discussion of approaches to sediment classification and methods of analysis. Most of the rest of the book deals with glacial sediments in different glacial environments, notably on land, in lakes and in the sea. Perhaps the highlights are the two chapters on glaciomarine processes and sediments. In these, Michael Hambrey draws on his own extensive experience and identifies interesting contrasts between the Arctic, where meltwater is important, and the Antarctic, where meltwater is essentially absent; the glaciomarine processes and resulting sediments in Alaska and the Antarctic are quite different. Another highlight is the discussion of structures and foliation in glaciers, another field where Hambrey uses his own specialist experience. Throughout the book a neat perspective is introduced by constant reference to

the way in which the study of modern sediments can help in the understanding of ancient glaciations, whose traces are preserved only in the rock record. We realize just how often Ice Ages affect the Earth.

There are nice touches to the book. There is a fresh historical perspective drawing attention to the role of early researchers in the Alps, and the effective use of a pack of cards as an analogy for foliation. Also, there are diagrams showing glaciations and the geological time scale as well as alternative methods of classifying sediments. There is a comprehensive ten-page glossary of technical terms and a full bibliography.

The coverage of glacial processes and landforms is less convincing. One reason for this is the decision to spare no more than one chapter to glacier dynamics, spanning ice characteristics, glacier flow, morphology, thermal regime, hydrology, response to climate, surges and debris transport. The result is a gallop where there is room for little more than a mention of the key processes, devoid of an explanation of why they occur and why they are important. Another reason is that the approach is very much that of an inductivist, with a focus on classification and description. This means that glaciological theory is underplayed. For example, ideas in key papers by Hallet, Iverson and Shreve are not mentioned when discussing abrasion, plucking and meltwater, respectively. Whereas Hambrey is certainly able to emphasize the range and character of glacial landforms, it is partly at the expense of insight and understanding.

But perhaps this is to carp unnecessarily. It is only too easy to ask for more in a book. Glacial sediments are important and perhaps glaciologists and geomorphologists have been cavalier in their approach in the past. This book restores the balance and is a useful addition to the glacial literature.

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**MECHANICS IN THE EARTH AND ENVIRONMENTAL SCIENCES** by Gerard V. Middleton and Peter R. Wilcock, Cambridge University Press, Cambridge, 1994. No. of pages: 459. Price: £50.00 (hb); £22.95 (pb). ISBN 0521 441242 (hb); 0521 446694 (pb).

Only a minority of geography and environmental science students pay more than lip service to the 'physical' in

physical geography. Although good undergraduate courses, and some good research, can proceed without a proper understanding of relevant scientific principles from physics and chemistry, most of our work will benefit from, and some explicitly require, a good grounding in scientific principles. This book is intended to provide a broad working knowledge of continuum mechanics, and its application to earth and environmental sciences. Its authors come from Geography and Geology Schools in